

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
 AMERICAN SOCIETY FOR ENGINEERING EDUCATION (ASEE)
 AMERICAN INSTITUTE OF CHEMICAL ENGINEERS (AIChE)
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AUGUST 2007

ENGINEERS FORUM ON SUSTAINABILITY

SUSTAINABILITY MOVING INTO ENGINEERING EDUCATION

There is a rapidly growing movement to integrate sustainability principles and practices into education at all levels. In the December, 2006 issue of the Forum newsletter, we reported on the American College and University Presidents Climate Commitment to make campuses more sustainable and to address global warming. Over 300 presidents have signed on so far. In our March, 2007 issue, we reported on the Center for Sustainable Engineering established by Carnegie Mellon University, the University of Texas at Austin, and Arizona State University. In this issue, we report on the Network for Sustainability in Higher Education (DANS), and we have a special article on how young engineering students interested in the environment are influencing engineering programs.

The next meeting of the Forum is scheduled for Friday, September 21, 2007, in the Lecture Room of the National Academy of Engineering in Washington, D.C. The Forum will meet from 9:00 a.m. to Noon, and the AAES International Activities Committee will meet in the same room from 1:00 p.m. to 4:00 p.m. Please mark your calendars now. Detailed agendas will be mailed out in advance of the meeting. We look forward to seeing you on September 21.

Al Grant, Forum Chair

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SPECIAL ARTICLE

LIVE GREEN OR DIE: Environmentally Aware Students. Growing Global Needs. Can Engineering Schools Develop "Eco-Friendly" Programs Fast Enough To Save Our Planet?

(Ed.Note: Written by Jo Ellen Meyers Sharp, and published in the PRISM Magazine of the American Society for Engineering Education)

Growing up in Oregon, Brianna Dorie never cared about eco-buzzwords. But she did treasure the environment - to the point it determined her career path. "I actually decided to become an

environmental engineer after learning about the hole in the ozone layer as a kid," recalls Dorie, now a first-year doctoral student in environmental engineering at Purdue University, where she's researching the public-health impact of fire retardants in electronics and other products. "I thought at an early age that it could be fixed."

Dorie, a University of Portland civil engineering graduate with a master's degree in environmental engineering from the University of Arizona, is among a new generation of students eager to protect the planet. Their favored tool: green engineering. The eco-friendly focus has prompted the nation's engineering schools to examine their offerings and rethink overall educational philosophies to give conservation and sustainability the high priority that the public and industry now demand.

Purdue's College of Engineering is a leader in revamping the curriculum to emphasize environmental considerations across disciplines. The goal is to infuse sustainability principles throughout courses and projects. Purdue's dean, Leah H. Jamieson, Ransburg Professor of Electrical and Computer Engineering, sees the new eco-focus as "an opportunity for engineering and science to be perceived as a profession that is squarely in the realm of societal responsibility and meeting global challenges." Engineers have enhanced life with sewer systems and power grids. Now, "sustainability is part of the global discussion," notes Jamieson.

Such "grand challenges for humanity" help draw students like Dorie to engineering. Her research, for instance, focuses on public policy and the life cycle of brominated flame retardants, ubiquitous organic compounds that prevent pajamas, electronics and other items from catching fire. Elevated levels have been found in mammals, raising concerns about their toxicological effects. Some countries and states have banned their use. By analyzing the environmental impact of these "micropollutants" from manufacture through use, recycling and disposal, Dorie hopes to discover ways to reduce their potential harm.

Every year, Jamieson encounters students like Dorie who "want to improve the world." Many once hesitated to speak up for fear of ridicule. Today's campus, says Jamieson, is far more welcoming. Revamped, multidisciplinary courses have made students more aware of the role they can play in tackling global problems. At Purdue's Global Sustainable Industrial Systems research center, for instance, projects include analyzing the ecological impact of everything from manufacturing to political processes.

"There's a real climate of collaboration right now," says Jamieson, who cites such factors as the increase in public interest, industry's need to meet environmental regulations and concerns over the availability and cost of oil and gas. It not only brings together such diverse disciplines as agricultural science, chemistry and engineering, but government and industry as well.

To foster collaboration and spur more engineering schools to address environmental issues, the National Science Foundation and the Environmental Protection Agency have funded research to develop benchmarks, methods and other best practices related to teaching sustainability. A \$2 million federal grant, for example, supported the development of Carnegie Mellon University's new Center for Sustainable Engineering (CSE)--a partnership with the University of Texas at Austin and Arizona State University. The goal: help future engineers preserve scarce resources through faculty workshops, peer-reviewed educational materials and benchmarks to identify high-quality course content at the nation's 1,500 engineering programs.

"We are looking at all sustainable engineering programs to see what's out there, which schools have them and to determine best practices;" explains Carnegie Mellon civil and environmental engineering professor Cliff Davidson, CSE co-principal investigator. Engineers can no longer ignore arenas beyond their specialty, he says. Thus, CSE's partner institutions push students and faculty to develop solutions across traditional department lines. For example, Carnegie Mellon recently established a program to work with local leaders and businesses to restore abandoned industrial sites and other polluted "brownfields".

Part of the difficulty in promoting sustainable engineering, says CSE co-principal Braden Allenby, professor of civil and environmental engineering and ethics at Arizona State University's Ira A. Fulton School of Engineering, is that it tends to invite platitudes rather than practice. Federal grants, he says, will aid in "figuring out ways to do better engineering now and to train our students to consider the environmental and social implications of their actions".

Some students already are blazing the way. Carnegie Mellon doctoral student Shahzeen Attari, who is pursuing dual degrees in engineering and public policy and civil and environmental engineering, is typical of these multidisciplined minds. The public knows "something is wrong with the current system", Attari says. "The fact that we consume resources without taking the impact into consideration, the mounting effects of climate change and the fact that we are no longer connected to the land all start adding up and start people thinking." Attari seeks to harness psychology to change behavior by creating messages, procedures and incentives that communities could use to persuade residents to reduce consumption of materials that emit carbon dioxide. Some sustainability messages already are raising public awareness, Attari notes, such as "buy local" and consume less.

"People like the freedom to choose their lifestyles, what they consume and when they consume it," observes Attari. "However, the environment is a 'commons' that we share with other citizens of the world, and when individual choices start negatively impacting others, we need to understand how to change or alter those behaviors."

Academia's increased focus on environmentalism spans the globe. The Institution of Engineers Australia, the country's accrediting body for engineering education, has taken the lead in addressing the paucity of environmental content. It spearheaded the formation of a nonprofit sustainability think-tank called the Natural Edge Project, which pools research from myriad engineering-school and environmental-group partners and posts relevant textbooks, scientific papers and research on its Web site, www.naturaledgeproject.net/. Recently, the organization began developing curricula with individual universities.

Although Australia includes sustainability in its national engineering graduate competency standards, the accrediting body found little to support the concept in the classroom. "Anecdotal evidence suggests strongly that the level of integration within Australian universities is still marginal, even within the environmental engineering degree programs, which have been traditionally observed as the leaders in this area," says Natural Edge Project education coordinator Cheryl Paten. She predicts demand for environmental expertise is bound to surge as the region's population explodes. "Australia has a significant opportunity to lead by example", she believes, by providing engineering graduates "with the tools that can really make a difference".

Closer to home, a dash of internationalism has made a big difference for undergrads and Indiana University-Purdue University Indianapolis. For the past six years, groups have spent one week in Mannheim, Germany, touring corporations and local government offices in a three-credit course called GO GREEN. (The acronym stands for Green Organizations: Global Responsibility for Economic and Environmental Necessity.) Germany is a leader in sustainable development, and students return from overseas -- host partner Berufsakademie Mannheim is a cooperative education university -- with keener insights into the link between concept and commerce.

Most important, the students get to observe sustainability principles applied in daily life, from how employers conserve materials to "fair trade" products at grocery stores. "Students see how Germans recycle because it costs them money to throw things away," explains Patricia Fox, associate dean for administration and finance and assistant professor of organization leadership and supervision at the Purdue School of Engineering and Technology on the Indianapolis campus. "They come back asking 'Why aren't we doing this?'" Future engineers aren't the only undergrads learning to GO GREEN; the program includes majors in interior design, business, public and environmental affairs, art and communications.

These summer trips have spawned student as well as faculty reports on such topics as green roof designs, renewable energy, sustainable adhesives and the differences between sustainability

practices in America and Europe. Several papers have been presented at the World Business Council for Sustainable Development conferences in Geneva, and at ASEE meetings.

Mechanical engineering student Michael Reed, a 2006 participant, says the Mannheim experience changed his career path. "Before this trip, I was certain that I wanted to use my degree for a career in manufacturing," he reflects. Reed now aims "to make a difference" in manufacturing. "I want to be one of the engineers who help the United States become sustainable, along with the rest of the world."

Overseas travel "has definitely had an impact on the way I plan on conducting myself both personally and professionally," concurs Alan Benedict, another mechanical engineer in the 2006 group. "I have never really considered myself wasteful. Now that I have been to Germany, I see waste in the United States where I did not see it before..." Such revelations promise to transform engineering education even as it propels students like Benedict and Dorie toward greener frontiers, primed to protect Earth's future.

GOVERNMENT

EPA Promotes Sustainable Technology

The Pollution Prevention Act directed the Environmental Protection Agency (EPA) to develop and implement a strategy promoting source reduction, which is defined as any practice that reduces (1) the amount of any hazardous substance, pollutant, or contaminant from entering any waste stream or being released into the environment prior to recycling, treatment, or disposal; and (2) the hazards to public health and the environment associated with the release. These measures can range from simple techniques, such as covering exposed containers of volatile organic compounds or tightening loose pipe connections, to completely redesigning a production process or reformulating a product.

The EPA Sustainable Technology Division (STD) is a component of the National Risk Management Research Laboratory. The mission of the Division is to advance the scientific understanding, development and application of technologies and methods for prevention, removal and control of environmental risks to human health and ecology. There are four branches within the STD that plan, coordinate, and conduct a national program of multimedia research, development, and demonstration of cleaner technologies and tools for integrated pollution management for industrial processes. The Division conducts program activities through a variety of mechanisms including: in-house research, cooperative agreements with academia and non-profit organizations, interagency agreements with the private sector, and contracts with environmental consultants and for-profit companies.

The mission of the Clean Processes Branch is to develop and demonstrate clean technologies for pollution prevention, recycling and reuse, and to estimate their environmental consequences through industrial ecology approaches such as life cycle assessment. The major research emphases are on Green Chemistry and Engineering for Chemical Synthesis, and Pervaporation for Organics Recovery.

The mission of the Sustainable Environments Branch is to construct a strategy for sustainable environmental systems management using economics on approaches, water resource and land use planning, physical and ecological theory, law, technological methods and knowledge to reduce risks to human health and the ecology. Major technical areas include Environmental Economics, Sustainable Systems Theory, Law, Hydrology and Land Use, and Sustainable Technology.

The mission of the Systems Analysis Branch is to develop and demonstrate cost-effective decision making tools for use by the private and public sectors. Such tools integrate environmental solutions, life cycle concepts, value engineering, environmental engineering,

economics, trade-offs and pollution prevention factors. The major technical areas include Cost Engineering, Life Cycle Assessment (LCA), Chemical Process Simulation and Measurement, and Environmental Impact Measurement.

The Industrial Multimedia Branch mission is to develop, demonstrate and evaluate timely and integrated innovative engineering and scientific approaches to reduce air, water and land toxic pollution generated by the production, processing, and use of materials. The major research areas include the Mine Waste Technology Program, Technology Verification Work, Metal Finishing CSI Support, Lead Paint/Lead Soil Abatement, Base-Decatalyzed Dechlorination, Source Reduction Regulatory Program, and Fuel Cell Environmental Effectiveness Program.

For more information, visit <http://www.epa.gov/ORD/NRMRL/std>

EPA P3 Winners Announced

The National Sustainable Design Expo, held in the spring each year on the National Mall in Washington, DC, was created to bring together professional scientists, engineers, and business leaders around innovations designed to advance economic growth while reducing environmental impact. This year's Expo was held on April 24-25, 2007.

In conjunction with Expo, EPA hosts the Annual P3 (People, Prosperity, and the Planet) Award competition. This national competition enables college students to research, develop and design scientific, technical and policy solutions to sustainability challenges. Their designs are helping to achieve the mutual goals of economic prosperity while providing a higher quality of life and protecting the planet. Students and their faculty advisors compete for EPA's P3 Award and the opportunity of up to an additional \$75,000 in funding to move their designs to the marketplace or implement them in the field.

The following six student teams received the 2007 Awards:

Appalachian State University - Testing Technologies for Affordable Bioshelters - Students will design and build affordable greenhouses that are powered renewably to conserve energy, reduce demands for fossil fuels, and allow more food to be grown locally at lower economic and ecological cost.

Lehigh University - Containment of Highly Concentrated Arsenic-Laden Spent Refrigerant on the Indian Subcontinent - The team will construct a reactor and disposal site in West Bengal, to determine the best methods for analysis and disposal of sludge that is high in toxic arsenic.

Northwestern University - Solar Photovoltaic System Design for a Remote Community in Panama - Students will design and help implement a cost-effective, culturally sensitive solar power system that will meet the electrical needs of Santo Domingo, Panama.

University of Illinois at Urbana-Champaign - An Innovative System for Bioremediation of Agricultural Chemicals for Environmental Sustainability - Team will work to find an efficient way to reduce chemical leaching from agricultural fields that requires no maintenance, is easily installed, and uses naturally available materials.

University of Virginia - The Learning Barge: Environmental and Cultural Ecologies on the Elizabeth River - Team will collaborate with community partners, in designing and fabricating an off-the-grid floating field station.

Western Washington University - Bio-Methane for Transportation - Students will process biogas retrieved from local dairy farms, and use it in a high-efficiency, hybrid engine powered by natural gas.

For more information about the awards and the P3 Program, visit www.epa.gov/P3 .

ACADEMIA

Network Created for Sustainability in Higher Education

The United Nations has declared a Decade of Education for Sustainable Development, 2005-2014. As stated by the lead agency for the Decade, UN Educational, Scientific and Cultural Organization (UNESCO): "The international community now strongly believes that we need to foster - through education - the values, behavior and lifestyles required for a sustainable future. Education for sustainable development has come to be seen as a process of learning how to make decisions that consider the long-term future of the economy, ecology and equity of all communities. Building the capacity for such futures-oriented thinking is a key task of education."

Sponsored by the U.S. Partnership on Education for Sustainable Development, the Disciplinary Associations Network for Sustainability (DANS) is an informal network of professional associations committed to the following actions in support of education for sustainable development:

Support sustainability within the disciplines - e.g., creating venues (conferences, journal issues, grants, etc.) for sustainability-oriented research; and providing curricular and pedagogical resources for faculty to incorporate sustainability into their teaching.

Support sustainability across the disciplines - e.g., fostering relationships and collaborating with other disciplines and specialties to create meaningful opportunities for cross-fertilization of ideas and problem-solving around sustainability.

Support sustainability beyond the academy - e.g., engaging with policy-makers, non-academic NGOs, and the public in an effort to foster sustainability literacy; and supporting members who choose to take a public role in promoting the transition to a sustainable society.

Practice institutional responsibility - e.g., taking action to produce positive environmental, social and economic impacts of our organizational activities.

Adopt sustainability as a value - e.g., communicating our support for sustainability in the academic disciplines to our members; creating a discourse within our organizations about the significance of sustainability to our discipline (and vice-versa.)

The co-sponsors of DANS are the U.S. Partnership for Education for Sustainable Development (www.uspartnership.org), Higher Education Associations Sustainability Consortium (www.heasc.net), Association for the Advancement of Sustainability in Higher Education (www.aashe.org), Association Leaders for a Sustainable Future (www.ulsf.org), and Sustainable Energies and Behavioral Sciences (www.oaklandcc.edu/EST) .

Engineering organizations participating in DANS include the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the American Society for Engineering Education.

For more information, visit www.aashe.org/DANS

PROFESSIONAL ORGANIZATIONS

ASCE's 2025 Vision for a Sustainable World

The American Society of Civil Engineers (ASCE) held a "Summit on the Future of Civil Engineering - 2025," in July, 2006. The results of the Summit are incorporated in the recent

ASCE Publication "The Vision for Civil Engineering in 2025." The report includes a vision statement of a sustainable world. It summarizes the continuing sustainability issues and challenges facing the planet, and the ways in which the global engineering profession has adapted and progressed in addressing them.

The report describes some of the continuing sustainability problems in 2025 as follows:

"On the demographic front, the world is well on its way to a population exceeding 10 billion people in 2050. Today, people occupy more space on the planet than they did 30 years ago, and they are straining the earth's environment, particularly the needs for energy, fresh water, clean air, and safe waste disposal. During the past 30 years, gradual global warming has profoundly affected the more than half of the world's population that live within 50 miles of coastal areas. These areas have become much harsher places to live because of sea-level rise, increased storm activity, and greater susceptibility to flooding."

"Shifting demographics and population growth continue to strain the overburdened infrastructure. The shift of people from rural areas to cities and exurban areas has accelerated, resulting in increased population density around the world. In the developed world, infrastructure is aging, and maintenance or replacement has not kept pace with its deterioration. In the developing world, the need for new infrastructure outstrips society's ability to put it in place."

On a positive note, the report describes significant progress by the global engineering community and others in helping to meet the challenges of achieving a sustainable world. By 2025,

"Constrained resources and growing energy demands have led to the need to prioritize energy resources and utilize alternative fuels. The use of clean coal along with carbon sequestration, nuclear energy, and the use of renewable sources such as wind, solar, waves, and geothermal have made it possible to meet growing demands. In addition, increased urbanization has led to greatly increased use of mass transit, and much less reliance on personal automobiles, which has greatly reduced demand for fossil fuels. Most vehicles now use fuel cell technology or renewable resources, such as ethanol."

"Improved water purification methods, desalination technologies, and increasing use of closed-loop systems have helped to meet needs. There is a growing use of gray-water systems and a changing philosophy to purify water at the point-of-use in decentralized systems. This has reduced the need to treat large quantities of water to drinking water standards when only a small fraction is taken internally by humans. It has also led to energy savings for water treatment."

"New global standards for sustainable design, promulgated by non-government organizations (NGOs) have been implemented to meet the global demand for sustainability, overtaking the ability of any one country to maintain its own unique standards. Adoption of these international standards and best practices for sustainability has been facilitated by a growing awareness of liability concerns on a global scale. Increasingly, drivers for individual projects address regional and global issues as well as local issues because of converging environmental outlooks in the global community and the need for the sustainability and project integrity."

For more information on the complete report and other ASCE sustainability actions and activities, visit www.asce.org.

AICHE Sustainability Index™ and Road Map

Darlene Schuster, Director of the Institute for Sustainability, provided a status update on two projects of the Ifs. The Sustainability Roadmap developed by the industry members of the Center for Sustainable Technology Practices and the AICHE Sustainability Index, a benchmark for industry.

The Sustainability Roadmap is an Industry Developed Approach for Integrating Sustainability Concepts into Company Decision Making. CSTP (BASF, Cytec, Dow, Air Products, Honeywell, Interface Carpets, Shell Chemical have participate in the development) developed a roadmap for implementing sustainability decisions into gated process/product development. The roadmap is an interactive tool which will help companies evaluate sustainability aspects when considering new technologies, products, and processes. It covers all phases of a technology's life-cycle and is designed to engage all disciplines in an organization. It aids in the assessment of sustainability considerations and initiatives, both across the value chain—Business Strategy Alignment; Upstream Supply; R&D; Production; Industrial Customer Use; Consumer Use; End-of-life—and throughout a company's organizational structure—Executive Management, Business Unit Management; Finance; R&D; EHS; Engineering; Manufacturing & Operations; Logistics & Supply Chain; Sales; Customer & Technical Service; Marketing; Communications; PR; HR; Legal; IT.

The tool is designed to promote organizational learning towards sustainability by promoting collaboration within the business organization and providing general guidance as well as more specific sustainability checklists. The Sustainability Roadmap can support organizations that are either interested in integrating new sustainability considerations into their business or enhancing existing sustainability-related initiatives. A workshop to roll out the roadmap, sponsored by NIST, CCR, Inc. and IfS, will be held at NIST in Gaithersburg, MD on Thursday, September 13, 2007.

AIChE Sustainability Index™—A Tool To Benchmark Company Performance

The Institute for Sustainability has launched the AIChE Sustainability Index™ for the chemical processing industry and will be expanded to additional industrial sectors. Sustainability--and incorporation of sustainability concepts into industrial operations--is important to the future of corporate performance, to public acceptance of industrial facilities, and to the engineering profession and individual engineers.

As more corporations move down a sustainable path, they are finding that they need meaningful metrics to measure their sustainability progress at many levels, from that of the practicing engineering to the CEO. The objectives of the AIChE Sustainability Index™ (SI) are to leverage internal technical expertise to support the implementation and alignment of sustainability and drive better reporting of technically informed sustainability data.

The SI is intended for use by executives and business managers for total company business lines. Although the initial focus is on major energy and chemical companies, the expectation is that the index will grow to embrace other industrial sectors and be global in its assessments. While the publication will be silent on individual company ratings, companies will find it useful to benchmark themselves relative to the set of companies that make up the index rating. (Confidential company-specific analysis of company performance relative to SI benchmarks will be available for purchase through AIChE.

IfS research has shown that existing sustainability indices lack focus on key sustainability considerations, especially the technical aspects. We're creating an index that focuses on sustainability performance using quantitative data and technical innovations toward sustainable development.

The AIChE SI™ will differ from the other indices (i.e. Goldman Sachs Energy Environmental and Social Index for Oil and Gas Industry, Dow Jones Sustainability Index) because it will rely more heavily on quantitative performance indicators with a heavier weighting applied to various indicators of safety and environmental performance and technological innovation towards sustainable development.

Additional indices are being developed with funding from the United Engineering Foundation for the Engineering Construction industry, electric power/energy sectors. Workshops to discuss the criteria open to all, is planned for Electric Power October, 2007, Engineering Construction Sept 29, in Colorado Springs, Colorado. For additional information, contact ifs@aiche.org

The American Institute of Chemical Engineers (AIChE) formed the Institute for Sustainability (IfS) in 2004 to promote the societal, economic and environmental benefits of sustainable and green engineering. IfS serves the needs--and influences the efforts of--engineers and scientists in industry, academia, and government. Engineers and scientists working with IfS have defined sustainability as "the path of continuous improvement, wherein the products and services required by society are delivered with progressively less negative impact upon the Earth."

INTERNATIONAL

Business Leaders Call for Climate Action

The chief executives of 153 companies worldwide have committed to speeding up action on climate change and called on governments to agree as soon as possible on measures to secure workable and inclusive climate market mechanisms post 2012, when the Kyoto Protocol expires. The call was made in a business leaders statement issued at the UN Global Compact Leaders Summit in Geneva in July, 2007. The statement, called "Caring for Climate: The Business Leadership Platform," provides a global call from business leaders. The Un Global Compact, the United Nations Environment Program (UNEP), and the World Business Council for Sustainable Development (WBCSD) facilitated its development.

Signatories to the statement, including 30 from the Fortune Global 500, commit their companies to "taking practical actions to increase the efficiency of energy usage and to reduce the carbon burden of products, services, and processes; to set voluntary targets for doing so, and to report publicly on the achievement of those targets annually." They also commit to dealing with the climate issue strategically and to building relevant capacity. They undertake to work collaboratively with other enterprises on a sector basis and along their global supply chains, promoting recognized standards and taking joint initiatives to reduce climate risks.

According to the statement, business leaders expect from government the "urgent creation, in close consultation with the business community and civil society, of comprehensive, long-term and effective legislative and fiscal frameworks designed to make markets work for the climate, in particular policies and mechanisms intended to create a stable price for carbon." The climate statement concludes with an invitation to the UN Global Compact to promote the public discourse of actions taken by its signatories and, in cooperation with UNEP and the WBCSD, to communicate on this on a regular basis.

Also at the Leadership Summit, the UN Global Compact, UNEP and the WBCSD jointly launched "Caring for Climate: Tomorrows Leadership Today," which provides a collection of case studies of good practices by companies taking climate action.

Launched in 2000, the UN Global Compact brings business together with UN agencies, labor civil society and governments to advance ten universal principles in the areas of human rights, labor, environment and anti-corruption. Through the power of collective action, the Global Compact seeks to mainstream these ten principles in business activities around the world and to catalyze actions in support of broader UN goals. With over 3,100 participating companies and hundreds of other stakeholders from more than 100 countries, it is the world's largest voluntary corporate citizenship initiative.

For more information, visit www.unglobalcompact.org .

OTHER DEVELOPMENTS

Youth Council on Sustainable Science and Technology Awards UVA at P3 Contest

The Third annual National Design Expo and Awards Ceremony featuring EPA's P³ Award took place on April 24-25 in Washington D.C. These events were sponsored by the Environmental Protection Agency (EPA). The National Design Expo took place on the National Mall and was open to the public. This event featured forty-one college and university teams competing for the EPA P³ Phase I Award. Also exhibiting at the Expo were a variety of businesses, non-profit and government agencies showcasing their sustainable products and services. The Youth Council on Sustainable Science and Technology (YCOSST) exhibited, showcasing our recent accomplishments, such as the YCOSST Web site launch of the Citizen Science list serve. This event also presented an opportunity to expand membership and network with individuals interested in our mission.

This is the second year that YCOSST had the opportunity to present our YCOSST P³ Award to the team that best exemplified the following components. The criteria included considerations regarding development, deployment to regions with limited resources, materials, and youth involvement. Specifically, the youth judges considered the use of interdisciplinary collaboration; use of novel, innovative technologies to facilitate distance communication during research; and employment of sustainable practices during research. Other factors considered included the ability of youth or people without significant financial ability or property rights to obtain and use the device or invention; use of materials that are locally produced and available to the general population; ability of local populations to maintain the device or invention; integral involvement of youth during implementation, and direct benefit to youth. The award winning team received a \$1,000 prize as well as the opportunity to present at the 2007 Sustainability Student Conclave at the AIChE meeting on Sunday, November 4, 2007 in Salt Lake City, Utah.

Youth judges determined the YCOSST P³ Award winner based on the above criteria. They researched and read about the Phase I student teams prior to the Expo and at the event, they visited each exhibit and discussed the projects with team members. They chose the University of Virginia's (UVA) Learning Barge Project as the 2007 YCOSST P³ Award Recipient. Katelyn Keefe, YCOSST Co-Chair, presented UVA their award on behalf of the organization.

The University of Virginia School of Architecture, in collaboration with community partners, is designing and fabricating an off the grid floating classroom on the most polluted estuary of the Chesapeake Bay. This Learning Barge will provide interactive K-12 and adult education about the tidal estuary ecosystem, wetland and oyster restoration, sediment remediation and sustainable practices. Unlike environmental education centers located in pristine "nature," the Barge will traverse an important urban river linking Norfolk, Portsmouth, Chesapeake and Virginia Beach. Powered solely by solar and wind energy systems, the 32'x120' barge will filter rainwater and graywater in a contained bed wetland of native plants and use recycled and green materials and technologies. For more information on the UVA Learning Barge Project, please visit www.arch.virginia.edu/learningbarge

UPCOMING SUSTAINABILITY EVENTS

The International Program at the ASCE 2007 Annual Conference in Orlando, includes several sustainability-related events. On October 31, global anti-corruption activities will be addressed. On November 1, there will be an International Roundtable on Building Water Infrastructure for Sustainable Development, a Sustainability Symposium on Water Issues, and a Forum on Delivering Sustainable Infrastructure. For more information, visit www.asce.org.

NIST, Council for Chemical Research, Inc., and the AIChE Institute for Sustainability Center for Sustainable Technology Practices is sponsoring an introductory workshop on the Sustainable Development Roadmap on Thursday, September 13, 2007 at NIST in Gaithersburg, MD. A limited number of spaces are available. To register or for more information contact ifs@aiche.org.

ECC (Engineering and Construction Contracting Association) is holding special session on Sustainability; What is the Benefit for Our business at Sept 27-28, 2007 conference, Broadmoor Hotel, Colorado Springs, CO. For more information see <http://ecc-conference.org>

For more information on this newsletter

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